

### ABSTRACT OF THE DISCLOSURE

An optical system for monitoring or imaging a sample includes a probe, an optical splitter or circulator, and an optical detector. The probe includes an optical fiber and a GRIN fiber-size lens fused to one end of the fiber. The optical splitter or circulator  
5 receives light from a source and directs a portion of the received light to the fiber. The optical detector is coupled to receive a portion of light collected from the sample by the GRIN fiber-size lens and is configured determine a characteristic of the sample from the received light.

10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60  
65  
70  
75  
80  
85  
90  
95  
100